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program

treeline

partnering for climate adapted forests

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Missed the July Treeline Newsletter? Click [here](#) to learn about how our partners are dealing with disturbance related to climate change.

Interested in submitting an article? Reach out to Kayla Seaforth kseaforth@b-e-f.org

Photo Credit: Friends of the Tualatin River National Wildlife Refuge

Treeline aims to: Engage PNW restoration practitioners, nursery partners and researchers who work for or represent tribes, indigenous groups, non-profits, agencies, businesses and more. We gather, disseminate, and discuss information and knowledge across a broad region.

The Capacity Building Issue

This issue of Treeline focuses on the steps federal, state and local governments, tribes and NGOs are taking to build capacity for sustained commitment to ecological and community care well into the future.

Editor's Note

The word “capacity” is tossed around a lot in the work that the readers of Treeline do. Capacity for plant production, workforce capacity, social and emotional capacity, capacity of natural systems to adapt. It often feels like the word that is plugged in when things aren't working the way we wish they would.

In a time where extreme events are the new normal, many environmental professionals are working at the upper limits (or often past the limits) of their

personal capacity, struggling to bear witness to the early manifestations of the climate crisis while simultaneously feeling the weight of doing the small part they can to mitigate it.

I really value the stories compiled in this issue, because they look at the concept of “capacity” from all different angles. Some are accounts of workforce building programs; increasing the number of green collar worker planting plants and pulling weeds. Some look at institutional capacity; how we build or rebuild support systems in a time when events that used to be called natural disasters

happen every other week. Some look at relational capacity, how we build lasting relationships between organizations and across different goals to take on enormous challenges. All of these stories have an undercurrent of the social and emotional capacity that it takes to effectively exist in such turbulent times, all while working for a better future.

I hope the stories in this and other issues of our newsletter spur ideas, inspire connection, and remind you that you are not alone in the work you do.



Building Resilient Communities: A Place-Based Approach to the Need for a Conservation Workforce



Interview with 10,000 Years Institute's Jill Silver

Conducted by BEF's Julia Jaquery

As agencies work to conserve more land throughout Washington State, the need for a restoration-focused workforce is increasing. Some limited-term work crew models exist, including AmeriCorps, which provides opportunities to work outside and stemmed from the New Deal's Civilian Conservation Corps. However, given the need for long-term engagement with ecosystem management for restoration to be effective, some organizations are developing year-round programs centered on place-based, localized relationships to the landscape.

One such organization is 10,000 Years Institute (10KYI), based in Forks, WA. We interviewed the director, Jill Silver, to learn more about the year-round restoration program that she helped develop, and find out how this model might be replicated in other places.

JULIA JAQUERY: Hi Jill, thank you so much for being here today. We're here to discuss the year-round Pulling Together in Restoration program, which you developed to provide a locally-based workforce for conservation, restoration, and resiliency projects on the Olympic Peninsula. Can you share a bit about how the program came to be and what it looks like today?

JILL SILVER: The Pulling Together in Restoration (PTIR) program is a locally-based Conservation Corps, except that it's year-round, without term limits and hires locally to support stewardship practices in traditional natural resource-based industries. We're working on a federal or state proposal for \$30 million per biennium for the [Olympic] Coast. That's still a drop in the bucket in terms of the hands, eyes, and effort that need to be invested in the variety of different projects in forests, rivers, and coastlines across our rural coastal landscapes.

We first proposed the idea for PTIR in 2013 at the request of The Nature

Conservancy. I had been looking for a way to grow the invasive species projects on the Hoh River that had been struggling for very scarce funding for almost two decades. Because invasive plants know no boundaries and don't disappear after two years of treatment, I wrote a proposal for a Conservation Corps-style, year-round, locally staffed, cross-boundary, multiple watershed based, multiple landowner, continuous invasive species project.

We've built the program into a service and local 'field college' conducting invasive species surveys, developing methods and protocols, and providing preventative treatments for restoration projects, roads, in forestry, and in rural communities.

We ranked number 1 out of 14 projects this year, so we're funded again through 2025, and by 2025, I'm focused on establishing the CCC and achieving the \$30 million investment in communities, 140 jobs, and resilient watersheds. All of the millions of dollars of restoration projects that occur on the coast every year typically involve disturbing the dirt-woody debris movement, riparian enhancement, fish passage barrier removal and replacement, and habitat enhancement projects; as such, they're almost all working in places where invasive plants exist or can be introduced. It's taken several years of encouragement, but in the restoration grants, there's now an addendum now that asks, "do you have invasive species? What are your plans for dealing with them?" We have this funding, trained staff, a track record, and relationships with agency and program managers and most landowners. So we just offer to do the [invasive species removal] work for

restoration sponsors, and to teach them and their staff at the same time. Many are turning to us to provide the work that will support success in restoration over the long term.

We hire locally. Forks is a hard place to get people under 30 to come and stay. To be able to do the kind of evaluation and response at the level that we do it, we take data everywhere we are, and we develop management strategies around it. We do adaptive management, and applied science. That's really what our mission is. And we do invasives because we are focused on protecting ecosystem services and native biodiversity. Native plants form the foundation of all the habitats, industries, and services we rely on for clean water, air, carbon storage, fish, food, soil, and climate — and invasive plants arrest the succession and health of native plant communities.

Looking Forward: Expanding the Vision for the PTIR Program

Current Budget & Capacity: \$1.4 million per biennium; up to 25 local jobs

Funding Source: Washington Coast Restoration and Resiliency Initiative (WCRR) — funded by State capital budget with a focus on creating jobs, resiliency, and addressing climate change impacts

Types of Projects Funded: Flood risk reduction, forest restoration thinning, nearshore restoration

Projected Budget & Capacity: \$30 million per biennium; up to 120 crew jobs + 20 supervisor positions



Snahapish crew and large wood.
Photo Credit: 10,000 Years Institute

Comparing Models

Current Capacity	10,000 Years Institute's Pulling Together in Restoration Program	AmeriCorps 10-Month Crew Work Model
Time scale	Year-round; indefinite	10 month cycles; 2 term limits
Age limits?	No	Yes — 18-25 years old
Jobs	Up to 25	6
Region served	Olympic Peninsula	Washington State

JJ: How long do field staff typically stick around? Does it make a big difference in the crew's perspective of the landscape to have locals doing the work?

JS: Good question. We have some folks who've been with us as long as eight years, which is wonderful. We take everybody who walks in the door who is in physical shape to be able to make it out in the field, who hopefully has some experience hunting, fishing, hiking, boating, landscaping, or even helping their grandmother in the garden. We work to give them the knowledge to understand the watersheds they live in— to know who else is living there, know which way the winds come from, where the water flows from and what has happened to the landscape, and about native plants and their functions in the places they grow.

We have a fair amount of turnover because we're taking everybody, and there are a lot of people who either don't like it, or can't show up for work for one reason or another. We work for a long time with each other to get through issues. Other folks really love the work. They all know each other. Their families all know each other. Tribal logging and fishing communities, folks whose parents work in the local prisons, people whose parents work for the agencies like DNR, or who operate heavy equipment for roads or mining gravel. We hire retired foresters and loggers who help with logistics and setting up projects and programs. I have a 78 year-old support staff — retired from the Coast Guard, volunteering as the president of the Pacific Coast Salmon Coalition — who goes out and cuts fallen trees out of the road for us on routes that we need to get into, and takes us out in his drift boat or canoe if we need to get across

a channel and the river is too high. He's been training his granddaughter, taking her with him all over the area, and I'm hoping to hire her! She knows all the roads, and everything that he does with fish, beavers, and habitats, and loves to pull Scotch broom. We're hiring families, grandparents down to grandkids, locally.

In the past, I wasn't able to get onto some properties because of my reputation as an environmentalist. I worked for the Hoh Tribe for nine years and stopped a lot of timber harvests when they were in places they shouldn't have been. Since, I've switched to doing invasive species work. Removing Scotch broom and tansy ragwort protects people's tree farms and their animals — that has established that we have shared values, and provided a pathway to step into the conservative world in such a way that there's no conflict. We have a WCC crew out of Port Angeles and another out of Elma in their third season with us.

JJ: The Washington Conservation Corps crew is on a 10 month cycle. Do you find that that's a good program to hire from?

JS: Oh, my goodness, they are so good. They go to WCC looking for this kind of work. They know what they want, and they know the jobs that they're going to be offered when they get out, and they have the educational background to support them in the jobs.

As I was looking for support to build the CCC, I had meetings with the lead of the WCC program, and asked if they'd consider the year-round Conservation Corps concept with \$30 million per biennium; but the answer was no, it's not their model. The problem for everyone out here on the coast and

perhaps statewide is that there aren't enough WCC crews to meet the needs, and not enough housing for them either, and their commutes are long and carbon-heavy. In order to reduce the time and carbon for travel, I request crews that are based in Port Angeles to work from Port Angeles through the Sol Duc to Forks, so that they only have an hour drive. The crew from Elma works on our South Coast areas. We need people who are local.

Really, what I want is to be able to inculcate what we know and what we do, and expand the model so that stewardship is the platform from which all communities are functioning. Yes, they're doing timber harvest. Yes, they're fishing. Yes, they're doing recreational tourism. But they're doing it with an understanding of how it all connects.

JJ: Right. Operating more from resource consciousness, rather than resource extraction.

JS: Exactly. I mean, they'd be doing both, but they'd be extracting within the bounds of what they can protect in ecosystem services. Most people I've worked with out here didn't believe in climate change, and many still don't. Some are starting to— if they're open-minded enough to check into the heat domes, atmospheric river events, the disruption of rain events, rapidly melting glaciers, and increased flooding— if they're really paying attention. One thing folks comment on and observe are shifts in timing for berries and bees, and in species.

I've discovered that if you don't have the language for what you're seeing— who the plants, the birds, the insects are— if you don't have the concepts or the

curiosity, you don't see what is there. My goal is to keep planting the seeds and dropping the pebbles in the pond so the ripples go out and come back again, and to stay patient. I'm not a natural teacher, really, I want to be alone out in the woods, watching American dippers, watch the river flow and change; that's what I want to be doing. Hopefully the ripples are going to keep radiating out.

JJ: Is there an education component to your Conservation Corps program?

JS: As far as education, we ask people if they're going to go to school when they come in for an interview. I ask them if they like to read- I have an entire library of books here and I'm always buying more. I hand out books all the time, and I buy field guides for staff. Over the last two years, we've also been working with Peninsula College and Western Washington University's College of the Environment to develop a natural resources certification and accreditation at Peninsula College here in Forks, and in Port Angeles.

I provided input on the skills needed for the range of positions and work types we have here at 10KYI to include in the curriculum, and it has turned into a curriculum around natural resources from all aspects- forestry, fisheries, ecosystems, monitoring and collecting data, along with writing. Invasives are included, as well as drone videography, presentations, imagery; learning to report and communicate, and translate information. And then, internships with the scientific or survey projects that are happening- road engineering, setting up timber sales, conducting stream surveys for fish and macroinvertebrates, gradient and complexity, ambient monitoring- all of those will have internships available that are accredited, and some will be paid.

JJ: Thanks so much for sharing insight about these programs and for the groundbreaking work that your team has done and will continue to do on the Peninsula.

Bio:

Jill Silver conducts applied ecology in the coastal watersheds of Washington State in which she grew up, with a passion for developing projects and research that build locally-sourced knowledge into locally-based solutions to resolve challenging and interrelated issues. Building on a foundation of environmental studies and sciences coursework at The Evergreen State College, she has been the director of the non-profit organization 10,000 Years Institute for the past two decades, where her focus is assessing and addressing the intersections between climate change, forested and aquatic ecosystems, ecosystem services, and the negative impacts of invasive plants.

About 10,000 Years Institute:

Working with diverse partners and local communities from timber to tribes, 10KYI identifies needs and opportunities for education and jobs in research and restoration, and innovates methods that increase restoration success while decreasing cost and impact over time. Working from the foundational principle that people will steward what they know and love, 10KYI's Pulling Together in Restoration (PTIR) project is entering its fifth biennium, training and employing local crews in projects to protect native biodiversity and ecosystem services in the watersheds where their communities work and live. With proactive investment, this model can grow into local watershed-based and permanent year-round conservation corps that invest in people, and develop the skills needed to grow and support resilience into an uncertain climatic future.



Jill and Leo trenching along old tree bole.
Photo Credit: 10,000 Years Institute



All crew lined up.
Photo Credit: 10,000 Years Institute

The Case for Including Shrubs in Lowland Restoration Projects

By BEF Staff

Restoration practitioners pursue revegetation efforts for many reasons including, but not limited to improving water quality and salmonid habitat, enhancing terrestrial habitat for birds, pollinators, amphibians and mammals, restoring culturally important landscapes, and promoting resilience to climate change. The strategies to achieve these goals can vary significantly. If a restoration practitioner or group seeks to improve habitat for salmonids they may focus on restoring long lived conifers to the landscape to shade the waterway and provide durable sources of large woody debris. A project focused on improving pollinator forage likely relies more heavily on planting a wide array of forbs, and some flowering shrubs and trees. Specific objectives may vary from project to project, but all take place in the context of larger ecosystems that are made up of complex interactions between many plants, animals, fungi, microbes, and physical and climatic features. Trying to determine how to facilitate a complex ecosystem within the confines of available funding, relatively narrow timelines, and occasionally competing interests in land use is exceedingly challenging, but necessary for the health of our waterways and all they support.

To further complicate things, the climate crisis is creating urgency around restoring landscapes to conditions that will be resilient to rapid change and able to store carbon over the long term. Numerous initiatives to fund large scale tree planting have emerged and have opened up new funding options for practitioners. These programs often focus exclusively on tree species, and can leave restoration sites heavily simplified if not combined with other funding sources that support shrub

planting. To contribute to these conversations, we highlight some of the existing knowledge and research that describes the ecological niches that shrubs fill and that describes their potential roles in climate change adaptation.

In this current era of drought and wildfire, there are also concerns about shrubs serving as ladder fuels. We do not go into depth on this complex topic here, but invite experts to reach out to us for a future article.

Biodiversity and Habitat

HIGHLIGHTS

- 1 Shrubs are a large component of the productive ecosystems of the Pacific Northwest, and many species rely on them for food and habitat.
- 2 Without shrubs, both native pollinators and imported honey bees would not have enough food to survive, which would have cascading impacts on our ecosystems, agriculture and wildlife.

The native forests of the Pacific Northwest have historically been structurally and floristically diverse ecosystems. A large number of shrub species call this ecosystem home, and their presence is essential to support the wildlife that live and forage in forests. For example, one of the most ubiquitous shrub species in riparian areas within the



Photo Credit: Kas Guillozet

Puget Lowlands, salmonberry, occupies the understory, and often forms thickets that provide nesting habitat for songbirds. The flowers provide food for pollinators, and the berries are consumed by many animals.

From the forest floor to the top of the canopy, each layer of the structurally diverse forest of the Pacific Northwest supports unique nesting habitat for a wide array of bird species. Some birds nest on the ground under thick shrub cover. Others nest in the branches of mid-story, thicket forming shrubs like salmonberry and thimbleberry. Some, like the willow-flycatcher rely on dense patches of streamside willows to hold their nests. The endangered marbled murrelet needs solid platforms, most often found on branches of old growth conifers to establish a simple mat of moss on which it lays its eggs. In most cases, it benefits birds to promote clumps and gaps within shrub plantings, which also increase structural diversity and habitat value.

Insects and pollinators also rely on healthy ecosystems with a robust shrub component. A study was conducted in the Blue Mountains of Oregon, along 11km of Meadow Creek in USFS Starkey Experimental Forest and Range to look at pollinator diversity among shrubs and forbs installed in a large-scale riparian restoration project. During restoration, over 50,000 native trees and shrubs were planted in the riparian area, including flowering-shrubs such as willows, currants (*Ribes* spp.), and

black hawthorn (*Crataegus douglasii*), which occur naturally in similar habitats throughout the western United States (Hoag & Landis 2002).

The study found that season-long, bee community composition on shrubs differed from that of forbs.

In riparian areas, shrubs play a key role during periods with less floral abundance for pollinators, since they often bloom early in the spring. This provides valuable forage for bees during the critical period of native bee emergence (Dumroese & Luna 2016; Bentrup et al. 2019).

In some communities, willows are one of few plant species blooming when bees first begin to emerge (Moquet et al. 2015). Many willows have sufficiently nutritious pollen and nectar to attract and feed bees (Roulston et al. 2000; Weiner et al. 2010; Saunders 2018), despite some being anemophilous.

Other life history traits, beyond phenology, may make shrubs valuable to riparian bees. The pollen of some shrub species has relatively high protein content. For example, Roulston et al. (2000) reported average protein in willow pollen as 41.4%, which is high, given a range of 2.4–61.0% protein observed in pollen from >300 plant species.

Willows and other streamside shrubs provide habitat for numerous insects that in turn support rearing salmonids in riverine and off channel habitats.

Shrubs are a natural and vital part of various Pacific Northwest ecosystem types, and if they are under-represented in restoration projects we may be shortchanging wildlife that rely on them.

Culturally Important Plants

HIGHLIGHTS

- 1 In an Indigenous worldview, all plants have inherent value. They are not seen as commodities, and all plants that occur in a natural system belong. This reduces the bias toward merchantable timber that a capitalist system has prioritized.
- 2 Many shrub species have cultural and spiritual significance to Tribes, and have been a part of the traditional diet and art for centuries.

The Indigenous Peoples of the Pacific Northwest's lifeways are closely intertwined with all manner of native plants that occupy the region. They have also stewarded the environment to facilitate the growth of these plants since time immemorial. Modern land use practices have drastically reduced the abundance of native plants across the landscape, and opportunities for harvest are limited, which affects community health and wellbeing.

This concept is well illustrated through a framework of social-ecological resilience, in which the health of an

ecosystem reflects and influences the health of proximal human communities through a number of factors. This framework has recently applied to **public health, planning and infrastructure**, and other fields, however this way of thinking has been common in Indigenous communities long before the present moment. Both historically and in the present, many Indigenous Peoples have relied on native ecosystems for food, shelter, and spiritual wellbeing, and have stewarded various landscapes to serve their needs. Embedded in this way of thinking is the knowledge that an ecosystem that supports cultural needs also supports wildlife habitat, ecological processes, and is resilient to disturbance and change.

For more on social-ecological resilience and huckleberry stewardship, see the piece in the **December 2022 issue** of *Treeline*, which was adapted from a blog post by Colleen Rossier and Bill Tripp.

The practice of stewardship that enhances socio-ecological resilience is well illustrated in the management of huckleberry patches up and down the North American west coast. Various huckleberry species occur across this range, and almost all were managed by Indigenous stewards pre-contact. Stewardship practices included burning, pruning and ensuring that patches remained accessible. These patches are now less abundant and accessible due to wildfire suppression and a lack of acceptance of cultural burning, forest management practices, and efforts to diminish Indigenous sovereignty. However, in recent years many Indigenous communities have revived efforts to restore huckleberry patches, often in partnership with non-Indigenous managers. One such **partnership between the Tulalip Tribe and the US Forest Service** has led to active management of huckleberry patches, preservation of access, and a venue for youth to learn about and carry out traditional practices.

Huckleberries are a widely applicable example, but most native shrubs have significance to Indigenous Peoples.

Plants like Nootka rose, devil's club, thimbleberries, salmonberries, oceanspray, salal, Oregon grape, elderberries, and many others have long been harvested by local Indigenous communities and tribes for food, medicinal and spiritual purposes. Willow, hazelnut and other shrubs are used in basketry and the fabrication of tools such as fish traps. Their inclusion in restoration projects not only opens up the possibility for greater co-stewardship, but also supports the vast and complex web of life that are vital to social-ecological resilience.

Mutualism

HIGHLIGHTS

- 1 While not heavily researched, native shrubs likely play a role in facilitating the mycelial networks that support life in the forest.
- 2 A transition from a competitive to a facilitative view of forest dynamics is underway, in which the various physical, chemical and structural components of individual plants and organisms support the system they exist within.
- 3 Many shrub species are adapted to a wide range of conditions and can persist or recover quickly amid stressors like prolonged drought and flooding, which may intensify with climate change, adding resilience to the landscape as a whole.

While humans often interact with the forest through the above ground world; picking ripe berries from bushes; watching birds duck in and out of cover; picking a mushroom after a fall rain; some of the most important work that forest plants do happens underground. Shrubs in particular, play a large role in nutrient cycling — converting atmospheric gasses to mineral forms that can be used by other plants in the forest to aid in growth. Many shrubs are deciduous, and their annual cycle of dropping leaves in the fall contributes to the forest litter that breaks down to become rich and productive forest soil over time.



Photo Credit: J.P. Zagarola

In arid landscapes, nurse planting schemes are sometimes used to facilitate plant survival. The nurse plant theory goes like this: certain species, often shrubs, facilitate the survival of the plants around them through a variety of mechanisms. These mechanisms include things like protection from UV radiation, moisture recruitment, protection from herbivory, seed trapping, and increasing the presence and diversity of mycorrhizal fungi. Where resources are more readily available (i.e. in much of the Pacific Northwest) nurse plant effects may be less noticeable, however as temperature extremes continue to increase in frequency, practitioners may choose to borrow strategies like nurse planting to mediate the effects of climate change.

Some morphological traits of shrubs may lead to greater adaptive capacity in a changing climate. Some evidence suggests that shrubs dedicate less energy to supporting branch and stem tissue than trees, and thus can allocate more resources to root growth. A more robust root system, especially when paired with the ability or tendency to resprout, may lead to greater regrowth following disturbance like fire, browsing and drought. Due to the multi-stemmed growth habit of shrubs, they have more bark area than trees, which may lead to a greater ability to sprout and grow new organs, especially after disturbance (Göttmark, et. al.).

The role of shrubs as supporters of forest life is understudied, with much

more research focused on income generating plants like trees. While the scientific community may not know the exact biochemical mechanisms by which shrubs support and facilitate functional forest ecosystems, it seems unwise to assume they are unimportant accessories, only valuable for the food and cover they supply.

Reducing Maintenance and Chemical Weed Controls

HIGHLIGHTS

- 1 Most trees (especially conifers) cannot be planted at a density needed to reclaim old fields or other sparsely vegetated areas and are often slow growing.
- 2 Shrubs can grow aggressively to compete with weeds which may reduce duration of required maintenance.
- 3 Dense shrub planting may be a strategy where herbicide use is not feasible or desired.

Planting is often just the first stage of implementation of a restoration project. Once plants are in the ground, surrounding vegetation often needs to be managed to reduce competition and habitat for plant eating critters like voles and rabbits. Invasive species may outgrow

planted natives in their first few years, and significant resources are typically allocated to managing them. Planting shrubs does not replace follow up maintenance, but it may reduce the amount time spent annually, and potentially the number of years maintenance is required. Fast growing shrubs may establish and spread rapidly in the right conditions, and shade some of the grass and weed species that compete with plantings. This theory has not been well researched, however could prove important as we look to reduce reliance on chemicals in sensitive areas, or where long term invasive control work is not feasible.

In ecosystems or locations where herbivory is a barrier to plant establishment, creative shrub planting schemes may provide plastic and metal free protection from browse. Plants that have sharp spines or form thickets could be employed as living plant protectors or fences. Western redcedar are sometimes planted together with Sitka spruce, since the spiny needles of the spruce deter deer and elk from nibbling the highly palatable cedar tips, or rubbing its bark as the trees grow. What about a nootka rose fence, or a Douglas hawthorn and Western crabapple thicket to act as natural barriers? These theories are under-tested, and may not work in every situation, but it may be wise to start thinking about how living plants can serve some of the needs that are currently met by non-renewable materials.



Photo Credit: J.P. Zagarola

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Concerns and Questions

- What is the role of shrubs in arid lands, especially where fuels reduction projects are implemented? Is there risk of simplifying the landscape in the name of fire safety if shrubs that act as ladder fuels are removed?
- What role do shrubs play in the transfer of pests and pathogens? Will there be an increased focus on this as new niches open up in an altered climate?
- Many shrubs fill in gaps readily following disturbance — especially when invasives are removed. Is it cost effective to plant shrubs when locally abundant and suitable species volunteer?
- Riparian buffers are often defined by tree height indices. Is there validity to prescriptions for shrub cover to promote healthy and diverse buffers?

Stratospheric Aerosol Injection: Implications for Ecosystems and Climate Mitigation Efforts

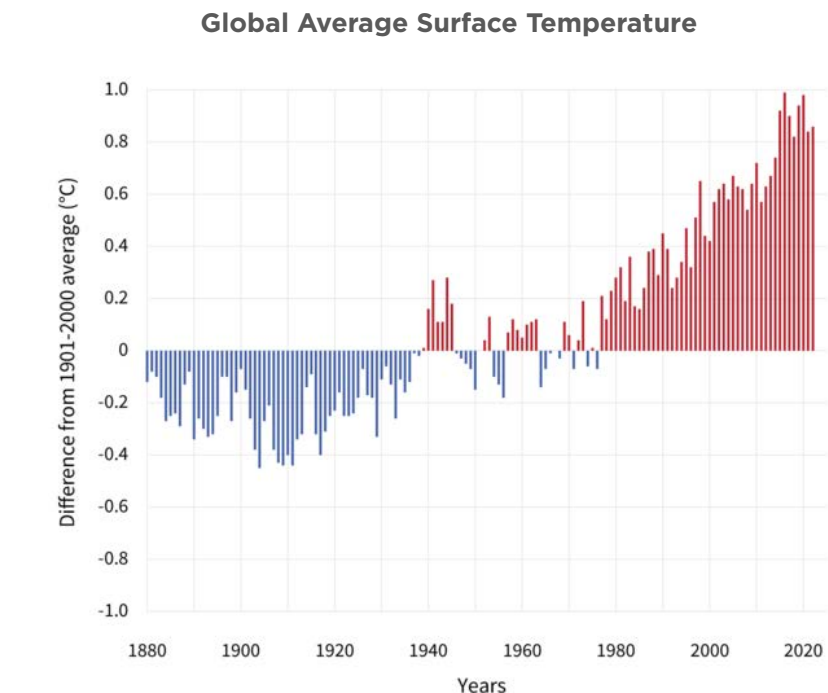
By Hannah Buehler

The treeline newsletter focuses on storytelling and information sharing at the nexus of woody plant communities and climate change. We hear frequently about the tough decisions that, for example, small woodland owners in Western Oregon and Washington are grappling with, such as whether to continue to plant species like Western red cedar or douglas fir, or whether they should look to more heat and drought tolerant species. These decisions are still made with decades-long conjectures about future climate change and the interplay with other local physical, biological and environmental factors.

New strategies to reverse climate change, like Stratospheric Aerosol Injection (SAI), throw another wrench in decision making processes. How likely are these interventions to occur in the next five, ten or twenty years? What might we expect about their local impacts on temperatures, UV radiation, pests and pathogens, and more? What do these impacts mean for plant selection now? This article describes SAI and gathers input from experts regarding potential implications for decision making regarding assisted migration and plant materials selection now and in the coming years.

As climate change continues to affect communities of plants, animals and people, even the most aggressive climate mitigation policies and strategies largely offer only delayed or partial respite from the impending impacts. New strategies for climate stabilization are being explored, and among them is Stratospheric Aerosol Injection.

Stratospheric Aerosol Injection aims to replicate the cooling phenomena that occurs following volcanic eruptions.¹



Source: [Climate.gov](https://climate.gov)

Volcanic eruptions push out enormous amounts of sulfur dioxide and other particulate matter, blocking sunlight from reaching the earth's surface, resulting in measurable reductions in global temperatures for upwards of a year following the initial eruption event. SAI aims to mimic this effect by intentionally injecting reflective particles, mainly sulfur dioxide, into the stratosphere using high altitude airplanes, balloons or artillery.² These particles, much like they do after a

volcanic eruption, would then act to deflect a fraction of the sun's heat and energy back out of the earth's atmosphere and into space before the full force of the sun's heat and energy can reach the earth's surface and carry out a warming effect.

The allure of Stratospheric Aerosol Injection lies in its relatively straightforward implementation and cost-effectiveness, and its ability to potentially significantly contribute

1 Keys, P., Barnes, E., Diffenbaugh, N., Hurrell, J., & Bell, C. (2022). *Potential for Perceived Failure of Stratospheric Aerosol Injection Deployment*. <https://doi.org/10.31223/x5805s>
2 *Stratospheric Aerosol Injection: A SRM geoengineering climate solution*. Geoengineering.global. (2023, March 3). <https://geoengineering.global/stratospheric-aerosol-injection/>

to global cooling.³ The science is relatively clear that SAI would produce a substantial and rapid cooling effect. However, in addition to complicated ethical and governance questions that would arise, the question now becomes: What else would SAI do?

Stratospheric Aerosol Injection practices would also result in unforeseen and likely uncontrollable impacts.⁴ On a global scale, there is potential for SAI to

temporarily make the sky appear hazy or milky, could alter the quality of sunlight plants rely on for photosynthesis, or harm the ozone layer. The most likely and significant issues however arise on the regional level. While the global temperature would quite likely be lowered as intended, recent research shows that SAI's impact on regional climates and weather patterns could be much more difficult to predict, ranging from increased precipitation and

flooding in some areas to droughts in others. These unpredictable changes to the quality of sunlight reaching plants as well as changes to precipitation patterns would have significant impacts on plant productivity. Stratospheric Aerosol Injection is also risky in that if the deployment of these aerosols stops, temperatures are predicted to dramatically rebound to the levels that would have reached had aerosol deployment not occurred at all.

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- 3 McKibben, B. (2022, November 22). Dimming the sun to cool the planet is a desperate idea, yet we're inching toward it. *The New Yorker*. Retrieved August 16, 2023, from <https://www.newyorker.com/news/annals-of-a-warming-planet/dimming-the-sun-to-cool-the-planet-is-a-desperate-idea-yet-were-inching-toward-it>
- 4 Tang, A., & Kemp, L. (2021). A fate worse than warming? stratospheric aerosol injection and global catastrophic risk. *Frontiers in Climate*, 3. <https://doi.org/10.3389/fclim.2021.720312>

Despite these major challenges and unknowns, SAI continues to be promoted as a viable climate mitigation strategy, largely by the fossil fuel industry as a way to slow movements to eradicate fossil fuel extraction.

We wanted to hear from resilience planners, climate scientists, foresters and ecologists in our community to illuminate how the deployment of SAI technologies could potentially impact plant and forest communities in the Pacific Northwest, as well as ongoing assisted migration initiatives, in order to shed light on the potential, the pitfalls, and the imperative for informed and conscientious action around SAI.

“Although this MAY cause a global reduction in warming, it may not play out that way in any local place.

Plus, what happens if it works too well? We might find ourselves with reduced agricultural production and continued droughts etc. Who knows what would happen. We only have one planet, messing with the stratosphere is a bad idea. We just don't know what its full implications are.”

- David Shaw, College of Forestry at Oregon State University

“A gentleman asked me at a recent conference if he was “stupid to keep planting cedar,” while he watches cedars on his Molalla Canyon property die.

My response at the moment was, “no, you might as well keep planting some because no one knows what direction the climate will be taking.” This is even more true if we start intentionally fiddling with the mechanisms that drive Earth's climate. In light of Rex Tillerson's surreptitious climate scheme, the only way to plan for outcomes now is to spread your bets. No particularly good reason to bet against cedar just yet if it only costs a few bucks to plant some... The world is remarkably resilient and productive, and given half a chance, Earth's systems will continue to function for our benefit. The question is, will we give it this chance?”

- George Kral, Co-Founder of Scholls Valley Native Nursery



Top view of a volcanic eruption.
Photo Credit: Pexels

“We’ve created a bit of a dilemma for ourselves. Our environmental challenges are fundamentally a product of our Western worldview, and are, therefore, fundamentally philosophical in nature.

In sum, we have a bad or broken relationship with the world because of mistaken assumptions we make about ourselves, the world, and the relationship between ourselves and the world. This suggests that we are not going to tinker and technologize (alone) our way out of our current mess. At the same time, some of these techniques might work, might buy us time — but they will not right our relationship with the world, they may only enforce it, and the belief that we can simply engineer our way out is part of the problematic belief structure in the first place. Engineering fixes are ultimately futile unless we also work to right our relationship with the world. If that’s what something like this can buy us time to do, then maybe they will be worth a try, but only if the work to do in that period of grace is nothing short of worldview remediation.

I’m reminded of this passage from conservationist Aldo Leopold: *“Our tools are better than we are, and grow better faster than we do. They suffice to crack the atom, to command the tides, but they do not suffice for the oldest task in human history, to live on a piece of land without spoiling it.”*

- Michael Nelson, Director of the Center for the Future of Forests and Society, Oregon State University

“The ability to do something doesn’t mean one should do it until the effects are fully understood.

The range of unintended consequences for these global engineered climate actions are concerning. Also the ability to model or predict these consequences seems out of reach with current tech. Another concern is rate of change and sustainability. Stable ecosystems when presented with rapid changes have shown they are unable to remain stable and in nature there are winners and losers in the race to adapt. Combine this with the ability of those in power to determine how to change the environment—to control who benefits and frankly to define what is a benefit seems rife for abuse against those with the least influence.”

- Bob Whitener, [The Whitener Group](#)

“Three issues come to mind. First is the misdiagnosis of the context for decision-making.

Aerosol injection is a solution that assumes that earth systems are complicated: Too hot? Turn down the heat. Simple! Yet Earth systems are not complicated — where one act causes a predictable result. Earth systems are complex, in constant flux with emergent interactions between species, humans, earth and sun. Whatever near-term benefit might be intended, the global impact of aerosol injection would be deeply uncertain and risky and will only reveal itself over time.

The second issue is around un-tipping a tipping point. Many earth systems have tipping points. Aerosol injection will not necessarily un-tip and could multiply the impacts of highly destructive feedback loops of earth systems. Lastly, SAI allows for the mother of all scapegoats. If someone injects aerosols into the atmosphere, they will forever be blamed for every extreme weather event that follows.”

- Steve Moddemeyer, Principal at Collinswoerman

California Reforestation Pipeline Partnership as a Model for Capacity Building

By Kayla Seaforth, BEF

California is currently facing a major need for reforestation following the large-scale, highly destructive wildfires of the last decade. Challenges to meeting their reforestation needs include shortage of trained personnel in all aspects of reforestation, a lack of quality seed for many areas, access to productive seed sources, limited capacity for seed processing and storage, and inadequate nursery growing space.

One major tool in meeting the state's reforestation needs is a collaborative partnership dubbed [The Reforestation Pipeline Partnership](#), a strategic collaboration between the USDA Forest Service Region 5, the California Department of Forestry and Fire

Protection (CAL FIRE) and American Forests to identify and address pinch points in the supply chain that enables reforestation. This partnership provides a forum for developing cooperative reforestation strategies, and forming the cross-boundary relationships needed to bring all of the elements of the reforestation pipeline together. They offer quarterly in person meetings, and huddles to pursue topics of interest to partnership participants. The program's manager, Shelley Villalobos describes the quarterly meetings as an opportunity for all of the groups that touch reforestation in California to come together in person to build the connections needed to tackle the complex issues associated with increasing the pace and scale of

reforestation in a changing climate. From these quarterly meetings, topics like organizing an all-comers cone collection training, creating new reporting infrastructure for seed surveys, increasing cross-boundary seed collection and sharing activity, and climate smart reforestation guidelines have all been taken up by the subgroups called huddles.

The partnership has also started the California Cone Corps, which is a workforce development program that intends to train new technicians on all aspects of the reforestation pipeline. Individuals hired through this initiative are placed with partner organizations including CAL FIRE and the US Forest Service to support their



Day 2 of Cone Camp in the Mountain Home Demonstration Forest. Photo Credit: Mark Janzen

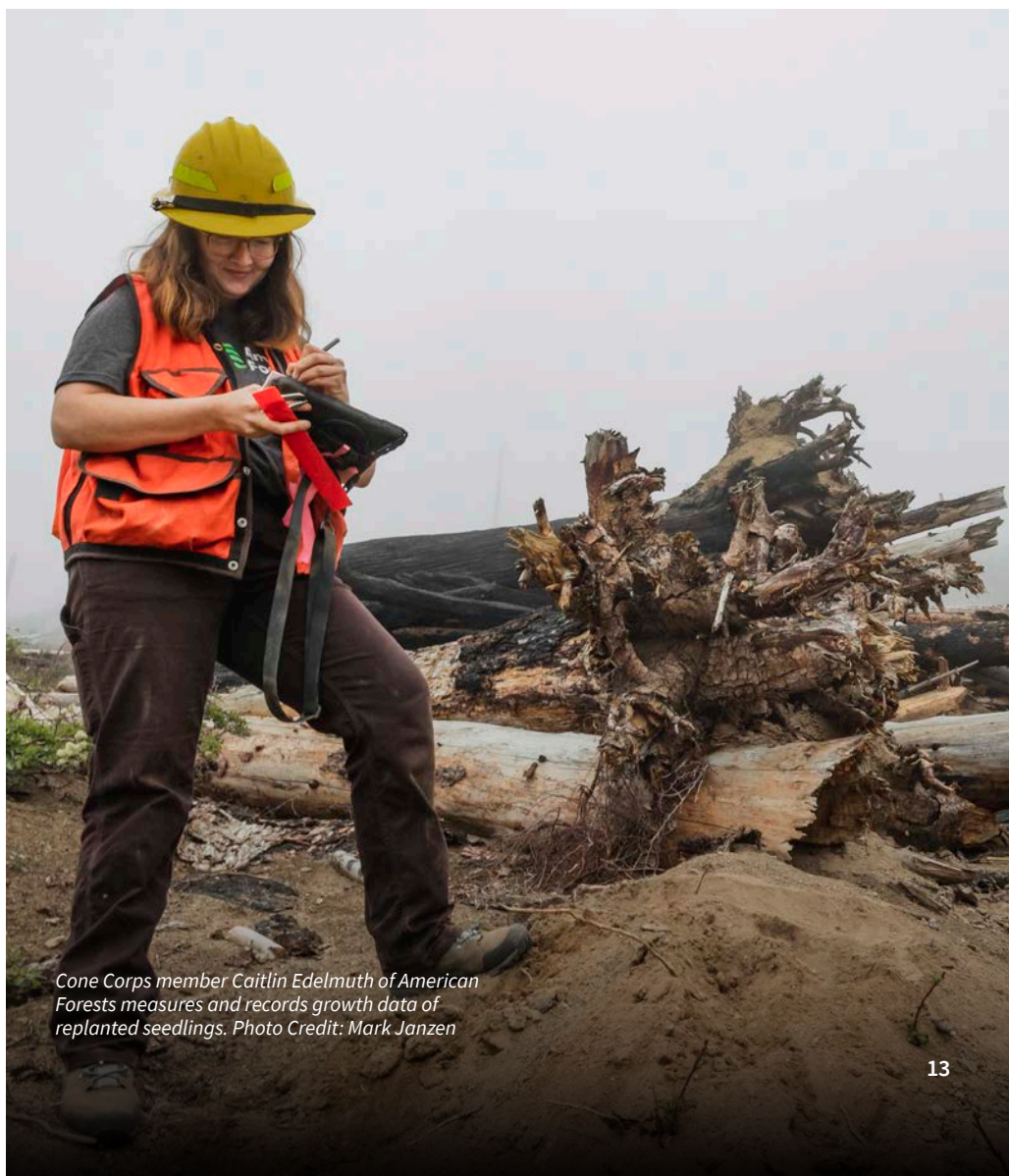
nurseries, seed orchards, and the forests themselves. The program's goal is to fill critical workforce gaps while training individuals to fill important management roles in the reforestation pipeline in the future. Cone Corps members are trained to implement and manage projects including cone surveys and collection, reviving seed orchards, working at reforestation nurseries, and more. According to Cone Corps project manager Bridget Mulkerin, the program has grown from 4 to 20 individual positions in just a year. "These positions are filling capacity gaps within our partner organizations," says Mulkerin. "Several positions have been extended beyond the original appointment, and 4 of our Cone Corps members have been offered full time positions by their site organizations after their term ended."

Additionally, CAL FIRE has made significant investments into its [Reforestation Services Program](#) to help meet the state's needs. Its nursery is working to increase capacity to produce 1 million forest seedlings per year — a 300% increase from the current capacity. This will still fall short of total seedling needs to address the reforestation backlog, but is a move in the right direction. The agency has also developed a funding mechanism dubbed the Emergency Forest Restoration Team (EFRT), which was created in the wake of the Dixie and Caldor Fires to get funds directed to on the ground efforts as soon as possible after fire moves through the landscape. The program pre-identifies funds, in partnership with local Resource Conservation Districts, which become available for the assessment and stabilization work necessary in the weeks and months after fires are suppressed. This strategy is important for funding time-sensitive work before agency budgets can respond or grants can be sought and awarded.

Investments like these are vital to meeting reforestation and restoration needs. The constraints in California are not unique, and other groups may look to the cooperative models that they have developed to build capacity and address the growing complexities of forest management as our climate changes.



Cone Corps member Noé Romo Loera of American Forests staking trees for monitoring future growth. Photo Credit: Mark Janzen



Cone Corps member Caitlin Edelmuth of American Forests measures and records growth data of replanted seedlings. Photo Credit: Mark Janzen



Engaging Underserved and Vulnerable Populations in Post-Fire Community Care

In September 2020, Oregon's central Cascade region experienced the most destructive wildfires on record for the state — the Archie Creek Fire east of Roseburg, the Holiday Farm Fire along the McKenzie River east of Eugene, the Beachie Creek-Lionshead Fire Complex east of Salem, and the Riverside Fire east of Woodburn, known collectively as the Labor Day Fires.

Within the heart of the Holiday Farm Fire lay the rural town of Blue River, which all but burned to the ground. Many people lost their homes, and many without homes fled to Eugene for respite. Eugene and Springfield, engulfed in thick wildfire smoke, were barely safer for unhoused residents without

many options for indoor spaces to escape to. In response, several Eugene community organizations banded together to address the dire need for respite: Black Thistle Street Aid (BTSA), McKenzie River Trust, and CORE.

Julia Jaquery, on behalf of the Oregon Fire Resilience Network interviewed Mackenzie Ní Flainn, executive co-director and co-founder of Black Thistle Street Aid, to learn what the response effort looked like— and to gain a deeper understanding of the intersectional issues facing underserved and vulnerable communities.

JULIA JAQUERY: Hi Mackenzie. Can you give an overview of what your

program does and how you responded specifically to a fire-related emergency?

MACKENZIE NÍ FLAINN: Sure thing— Black Thistle Street Aid is a medical collective that does direct humanitarian aid outreach and medical outreach, primarily to unhoused individuals in the Eugene and Springfield area. We started that work in 2020 prior to the fires.

We employ multiple tactics for our work. We have phones that people can call if they need help in a non-emergency fashion, or refer other people within



The Oregon Fire Resilience Network is an emerging group of partners throughout the Willamette Basin and other areas of Oregon who are seeking to improve wildfire preparedness, response, and recovery for their communities. Some of the things these partners are working on include developing community wildfire protection plans, which would include plans for pre-fire preparedness, such as home hardening and access to smoke management supplies; “during the fire” response such as smoke shelters and smoke management, and evacuation plans that are inclusive of elderly and alter-abled folk; and post-fire recovery such as aid hubs that are open to all community members, regardless of housing or citizenship status.



Photo Credit: Black Thistle Street Aid

their own community or encampment for medical care. We also accept referrals from other community organizations.

We do once-weekly, walk-about style street medicine outreach. We carry survival supplies and hygiene supplies, and we always roll with at least one medical provider of some licensure status, preferably also a prescriber status. Herbalist harm reductionists and community health workers, basically people who know the system and how it works, can make referrals and can help people who are falling through the gaps. We have a once-monthly Street Clinic in a central location where people can find us if they need to.

What was important about what happened in the 2020 holiday farm fire was that we had already been doing that work. We already had community connections and we were already integrated. In responding to that wildfire, we simply shifted tactics slightly.

We started doing outreach to look for the people who are what we call “medically fragile”, as in, people who are already on the edge of not being able to survive. There are people with really severe chronic health conditions everywhere on the street- like missing

limbs, really bad open wounds, people with severe respiratory distress, people with cancer, et cetera. If I had to pick the most frequent identity intersection that I see on the street, it's actually being alter-abled or disabled in some capacity. Having a mental illness or a medical emergency that results in permanent disability is often what starts people on the road to losing housing.

When the smoke started to get really unhealthy, and we were also in the middle of the COVID-19 pandemic, our community was still so new in trying to figure out how to continue services to people who don't have access to phones or electricity or running water, much less four walls to live in. Services were shut down. There were no centralized shelter services at that point.

We started going out and targeting folks who we knew of, and those who were referred to us, as being too vulnerable to take the preparations necessary to deal with really severe wildfire smoke, and we started putting them in hotels. There was no evacuation plan. Initially, there was no clean air shelter. When it did come, it was only open from nine to five. That sort of tactic doesn't really work for people whose entire existence is in a camp by the river; they can't pick

up and check in and out on a nine to five schedule.

JJ: That's a really important point to make about pre-existing connections — we can't wait until these emergencies happen to expect to reach hard-to-reach communities. It takes continuous investment, year-round support, and relationship building to understand the scope of the challenges that they face and how to address them.

MNF: You can look at it through the lens of disaster preparedness if you want, or you can look at it through the lens of promoting autonomy within underserved communities- if you are serving them year-round then they're going to be able to respond better themselves. If you are listening to what they're asking for just to survive regular society, under the white heteropatriarchal collapse that we're in, then they're going to be more prepared to serve themselves in a disaster.

The collaborative or coalition model amongst people who are doing the nitty-gritty work really needs to be highlighted. A lack of understanding and validation of this model is a barrier that we've come up against in trying to get funding. The models of the

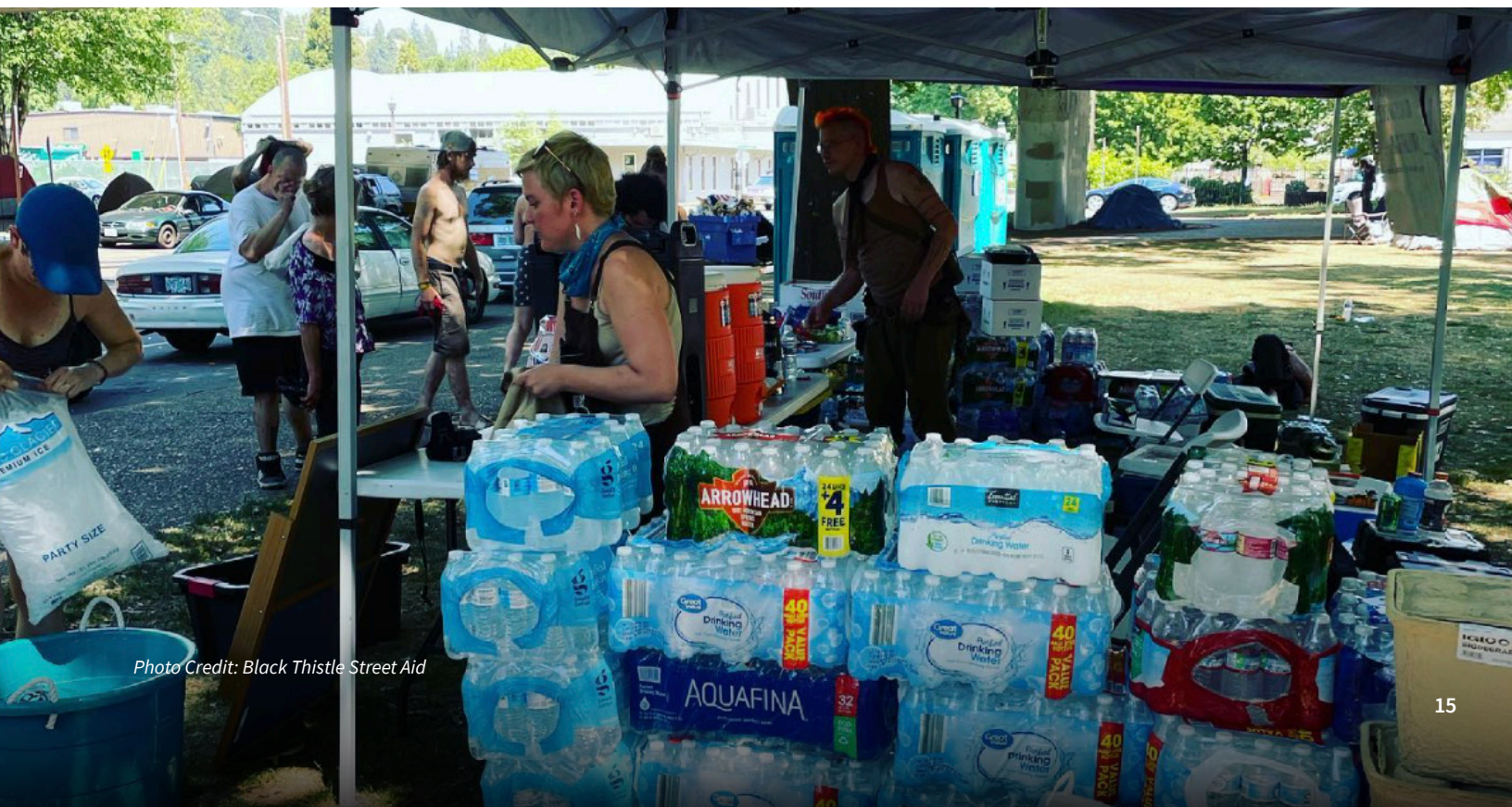


Photo Credit: Black Thistle Street Aid

nonprofit industrial complex are rooted in competition between community providers– we're all fighting for the same funding, and it creates divisions within the network of community providers. If you mention that you're primarily working with unhoused individuals, you're put in a little box for funding and which organizations crossover with you. They don't include you in wildfire response funding. At the same time when conversations around styles of relief happen for responding to disasters, there's also a desire for there to be one hub that's accessible to everybody– but that's never gonna work, right?

There has to be both an openness and also a cultural sensitivity. There has to be cultural specificity in how we respond, and we really should be letting the organizations that are working within those communities lead and provide them with the aid that they're asking for.

We have to be able to understand the network of support that has history and trust with these populations, and then support them as a network to continue to be good collaborators with each other. From there, the network can interact with centralized structures for shared resources like shelter facilities.

JJ: Did you work with other organizations closer to the epicenter of the Holiday Farm Fire? Did you end up going out towards Blue River and other communities on Highway 126?

MNF: No, we never went to Blue River ourselves. We didn't need to– the survivors flooded into Eugene. We had whole communities shift into RV encampments around the area, and not all of those were safe spaces that were provided– some of those people just happened to have an RV and fled, and landed on the street in Eugene.

There were a lot of people from rural communities that were in nebulous housing situations. They lived on someone else's land, and if those people didn't have a deed or a piece of mail, or if they were in some alternative living situation like trading help on a farm they

couldn't get any aid from the Red Cross, who required proof of address.

Our team is very small. There's a core of six individuals, and at the time that we were responding then, we had maybe 10 really active members going out multiple times a week. We were connected with the county, but at that time, almost all the county's funding had been diverted to COVID relief. We were able to step in and provide a more dynamic medical response for people who experienced things like injuries or burns, because the county was limited to only being able to provide COVID related care. Funding from government institutions tends to be tied up in a more concrete structure that they provide, and it limits everyone in the system. It's such a barrier.

Luckily, we had some good friends at the McKenzie River Trust, and they stepped in to manage the massive donations that the community provided. People showed up and said, “here's seven unmatched socks and three blankets, I just really need to help.” There really has to be someone managing the mutual aid. With the Trust's help, we were able to just show up at the donation hub and say, we need this and that, and they would have it ready to go.

Because McKenzie River Trust is a land project, they were also really integrated into the recovery project longer term, and they were able to give us a heads-up when they encountered survivors, so we could go and see if anybody needed help. Those were all informal, already-established community connections. The people who helped us and showed up were people that we already had deep relationships with. It became much harder to make sense of the other structures– everything else became so opaque that we weren't able to make new connections. Even with the disaster preparedness coalition of organizations, we were only able to get as deep as big donations of water.

We also worked with an organization called CORE: Community Outreach through Radical Empowerment, who took over feeding people. They are a youth-specific organization that serves folks between the ages of roughly 12 and 30– young people who are on the street or managing addiction. Youth, especially street youth, are hard to build

trust with, and hard to keep a hold of. We really needed help, especially trying to navigate services for young folks that are unhoused.

We had recently started partnering with CORE when the wildfire hit, to talk about how to competently serve youth on the street. Collaborating during the wildfire was a leap of faith that solidified our relationship moving forward. We co-responded– they took the lead on anyone that we found who was under 18, and we took the lead on anyone they found who was medically fragile.

One of CORE's main mechanisms in the community is that they manage a street feed. They had access to a commercial kitchen through community connections and were making all the food for all the people in hotels for a good while. Pretty quickly, we were able to start getting donations from local restaurants, other small businesses, or other community members that had access to “street feed”-type structures so CORE was able to get help and not have to do it full time.

They were also strong leaders for us around how to move a harm reduction model into individualized shelter care. That's different from helping people manage their own care– picking someone up and putting them in an isolated situation like a hotel room could be a dangerous shift to make. But at that point it was either the smoke or a hotel room, so they helped model how to shift our support tactics to still keep people safe around their substance use if that was an issue for them.

Our relationship with CORE was literally forged in fire. We really needed each other's community connections that were already established. They had food and harm reduction connections, we had medical connections and different types of survival supplies.

JJ: What relationships or partnerships do you think could have been helpful in that time, or could be helpful now?

MNF: At this point we need large buildings whose purpose is to respond to community needs. We need physical spaces that are integrated into emergency response, and an understanding that their primary function is to serve the community.

If that space needs to activate for use because the conditions have reached the point that they are life and death, then that's just what it does. We don't have to do a bunch of arguing about it.

We ended up leaning a lot on privately-owned hotels in order to both create a safe container for people in terms of the pandemic—as in, individualized shelter—and also provide them with clean air. There were only certain privately-owned hotels that were willing to rent to people who were perceived as being unhoused. We ended up managing 44 people for over two weeks in a hotel with our team and our partner organization CORE, which, luckily, took over feeding people.

Still to this day, we keep going to community meetings that are centered around county-level or state-level work, and they're supposed to inform a coalition to do community-level work. But what happens is a bunch of representatives from the big name organizations show up who aren't actually doing community-level work. And then we have this theoretical discussion about what a community

disaster preparedness plan looks like, but no one actually ever makes the disaster preparedness community plan for the city of Eugene, much less a culturally specific one for the Latinx population or the unhoused population.

What we saw during the Holiday Farm Fire happens on a smaller scale every single year. We're watching people have burns in the summer, get heatstroke, lack access to water—life-or-death crises happen every single year. As we deal with climate change, things like heat respite in the summer and warming shelters in the winter become increasingly necessary.

There is still no mobilization based on any climate criteria; like when the air index or the temperature reaches “this”, we will mobilize certain resources, and you can direct people to certain places. Maybe that criteria has to shift from year to year, but we need to be ahead of the season. We can't be dealing with what we already know is going to happen framed as disaster response—it's not a disaster, it's the climate that we live in right now. We can at least prepare for that.

We need to save disaster for when disaster comes—we need to make our communities integrated, for the level of fluctuation we have on a yearly basis, and be able to put in place very simple guidelines that people can follow.

JJ: Can you share about the non-disaster shelter infrastructure that was or wasn't in place before the fires? How did those shelters play into the response?

MNF: Shelters mobilized around COVID in March and April to provide 300 - 500 additional congregate shelter beds. 50 of those were set aside for medical respite, which were literally mats on the floor in large congregate settings— it was not appropriate for a COVID response. But it was the only thing that we had access to. Every single existing shelter program cut their density down by half. They actually sent some people out onto the street in order to create more space, so that they could meet the COVID parameters. Then, in June, the funding for the emergency COVID shelters ended. They closed them all. They kicked everyone back out onto the street. What opened instead was one centralized structure that was entirely dedicated to isolation and quarantine that had 50 beds, where patients had to be referred by a medical organization like a hospital or the county.

There was no response for the first entire week [after the fires]. After two weeks, when the clean air shelters opened, they were dispersed throughout the community, and they were not high-capacity or organized — there was room for maybe 50 people and there were no overnight options. This was not a place where we could send people who are unhoused to live in clean air. They were check-in and check-out situations, like spending the day at the library. As I said before, that type of response doesn't work with unhoused populations because they can't leave their campsites; their campsites aren't secure. They have to take all of their stuff with them if they're going to go anywhere, or at least all of their valuables.

Campsites weren't secure largely because the police department continued to enforce evictions and camp



Photo Credit: Black Thistle Street Aid

sweeps even during the wildfires. That happened more than once—we would show up at a camp and do an evaluation, hand out a bunch of supplies, and the cops would show up behind us to kick people out and throw their supplies in the garbage. The individual that we had the longest, his whole left side was paralyzed, he was wheelchair-bound, and we found him just sitting in a park, crying. The cops were there rousing out the rest of the people in that camp.

We could not get any type of response from city management or any type of cooperation from our local police department around the ethics of their response in that type of situation. We were really on them about how they were responding in severe weather situations and natural disasters. They'd say, talk to the city manager, talk to the official department for homelessness— they just sent us on a wild goose chase. Enforcing a camp sweep during a wildfire is a genocidal tactic. They continued straight through into the fall and the winter. Enforcement of camp sweeps during freezing rain in temperatures under 30 degrees is a genocidal tactic.

We can't talk about responding to disasters if we're not talking about the everyday violence that people are facing in these small communities. We need to be able to at least develop pathways of communication to address what's happening at the moment of disaster. If we can't even have those conversations when we're at the point of disaster, then that means we aren't serving people all year round. And we can't have those conversations during disasters if we're not having them all year round.

JJ: What would be your picture of a well-functioning mutual aid network, both on a community level and organizational level, when something like this happens?

MNF: I think what we need is individual networks that can function autonomously to respond to their individual communities, or culturally specific events that are happening. Disaster happens every day, on some level. We need to be able to liberate structures that are available to the public when there is a need for immediate response. A county-managed



Photo Credit: Black Thistle Street Aid

disaster shelter that is always ready to go would be helpful, within a certain range like a 50 mile radius.

We also need access to transportation as part of the response, like school buses—we have fleets of buses just sitting around elementary schools that could be mobilized, instead of re-routing the Lane Transit District buses.

These programs need to have an alternate referral pathway for disasters—as in, this is how you normally operate around profit, but this is what happens when disaster hits. When we reach a certain threshold those services should draw on a different type of funding wherein they operate for free and they get rerouted from their normal purpose. And we need to enable community providers that are operating in the nonprofit industry to be able make the calls for when those resources get mobilized, rather than having to go through a large county-level logistical process.

We need to maintain the public conversation around that idea for long enough to be able to have a base level of literacy around what that alternate activation system looks like, so that

everyone understands what is available during a crisis. In other places where communities manage severe weather and natural disasters all the time, like tornadoes or frequent hurricanes, there's a warning siren that goes off that means I have “this” long to get to “this” place. But on the West Coast we haven't developed that. The climate is becoming dangerous to human health, especially if you're on the edges of any type of immunocompromised or medically fragile category.

I'm not an authority at all to speak on Tribal mechanisms, but they have their own sovereignty structure.

We really need to start integrating an understanding of Indigenous-led ecological recovery on an everyday level, especially around wildfire ecology. We need to let those people lead and revolutionize how we understand the systems that are perpetuating the practices that create really dangerous wildfires.

There's an organization that I draw a lot of inspiration from called [Partners in Health](#). They're a nonprofit that goes into struggling economies in the neoliberal mechanism, places that have really severe health disparities, and they help them build health systems. They do that by partnering local traditional healers with the Western medical system. They take a very backseat approach and say, here's the connection between the culturally competent individuals on both ends of the spectrum, and we're going to help provide the political leverage to connect you to a state-level healthcare system. And then they provide structural support for those individuals to have a fruitful conversation as well as an influx of money.

That's a healthcare model, but they're not by any means the first group to understand that larger structures, such as state or county, can put a big influx of money into a situation in order to help community providers overcome structural barriers. Trying to apply an optimization structure to make sure that you are getting to people who are falling through the cracks is missing the mark. You need to be able to have inefficient systems, because communities and people are inefficient; we are organic structures. Even if they look like they have a wandering path, like a river, they're actually choosing the path of least resistance for them. And that needs to be supported as much as possible.

Bio:

[Mackenzie Ní Flainn](#) (she/they) is the executive co-director and co-founder of [Black Thistle Street Aid](#), a radical, anti-capitalist, abolitionist, harm-reductionist and femme/queer led healthcare collective on the land of the Kalapua people in Eugene, Oregon. BTSA primarily serves the community via free, outdoor walk-in clinics and direct medical outreach to unhoused communities in the Eugene/Springfield area. BTSA provides access to prescriber-level providers for prescription assistance and renewal, wound care, wellness assessments, medical advocacy and case management, full spectrum harm reduction services, reproductive and sexual health care and referral, as well as free herbal medicine and integrative consultation with clinical herbalists.

Mackenzie is a trained street medic, clinical herbalist, full spectrum doula, teacher, midwife's assistant, community health worker and certified massage therapist. She was born in the heart of the Columbia River Gorge, the oldest of three to a working class single mother in a tiny rural town, the descendant of mixed Dutch and Gaelic settlers on occupied and unceded Indigenous land of the Klickitat and Yakama people. The majority of her early activism centered around reproductive health equity and environmentalism, but she began working with people living on the street in 2018 which broadened her political education on health justice profoundly.

She is also the host of a small health justice podcast [We Take Care of Us](#) where you can hear more about the experience of working as a frontline healthcare worker serving the unhoused during the COVID-19 pandemic and the 2020 wildfires. **Mackenzie will be speaking at the Oregon Fire Resilience Network's event, Engaging Vulnerable and Underserved Populations in Wildfire Response, Recovery and Resilience, on September 28, 2023.**



Photo Credit: Black Thistle Street Aid

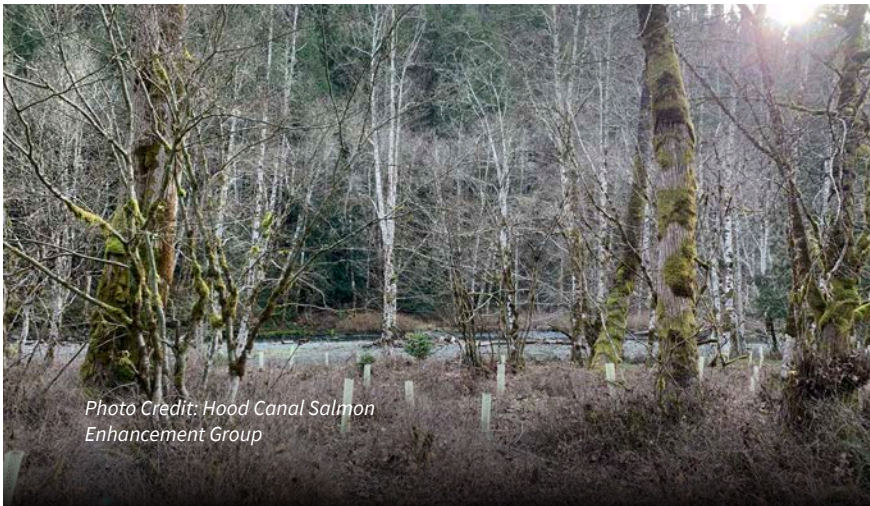


Photo Credit: Hood Canal Salmon Enhancement Group

Native Seed Film Series

The International Network for Seed-Based Restoration, a group hosted by the Society for Ecological Restoration has released a multipart video series about different facets of the native seed supply chain in the Western United States. All videos have been released and are available to view [here](#).

FUNDING OPPORTUNITY:

Inflation Reduction Act Funding for Small Forest Landowners

This grant offers support for small forest landowners to implement climate smart forest management practices and/or participate in emerging private markets for climate resilience and adaptation.

Learn more and apply [here](#).



Upcoming Events

FIELD TOURS:

Nisqually Community Forest Tour: Climate Adaptation Strategies in Practice

October 5, 2023
Learn more and register [here](#).

Stossel Creek and Oxbow Farm Assisted Migration Trials

October 6, 2023
A part of the 2023 Northwest Innovative Forestry Summit, these tours are a chance to see and learn about two Washington based assisted migration field trials. Learn more and register [here](#).

CONFERENCE:

State of the Beaver 2023

November 13-15
This year's state of the Beaver Conference will occur in Canyonville, Oregon and the theme is "The Path Forward." Learn more and register [here](#).



watersheds program

Do you have an idea for a future newsletter article or interview, or a suggestion for how we might improve? Please reach out to Kas Guillozet at kguillozet@b-e-f.org.

This issue of Treeline is supported by the *Building Nursery and Recovery Infrastructure for Climate and Fire Resilient Oregon Forests Project* which is supported in part by a subaward from an agreement between the USDA Forest Service and Sustainable Northwest.